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(General - Patent Pending)

Docket No.
FKI-26

In Re Application Of: **DONALD E. MOSING, ET AL**

FILE

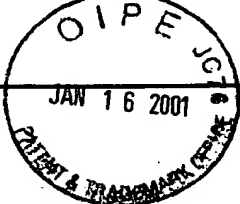
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09/206,876

Filing Date
12/12/98

Examiner
W. NEUDER

Group Art Unit
3672

Title: **IMPROVED METHOD AND MULTI-PURPOSE APPARATUS FOR DISPENSING
AND CIRCULATING FLUID IN WELLBORE CASING**



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Dated: *02/07/2000*

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Invention: **IMPROVED METHOD AND MULTI-PURPOSE APPARATUS FOR DISPENSING
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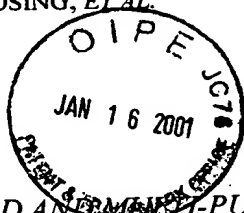
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: DONALD E. MOSING, *ET AL.*

SERIAL No.: 09/206,876

FILED: DECEMBER 08, 1998

FOR: "IMPROVED METHOD AND MEANS FOR MULTI-PURPOSE APPARATUS FOR
DISPENSING AND CIRCULATING FLUID IN WELLBORE CASING"



EXAMINER: W. NEUDER

ART UNIT: 3672

RESPONSE TO NOVEMBER 5, 1999 OFFICE ACTION
AND AMENDMENT TO APPLICATION

ASSISTANT COMMISSIONER OF PATENTS
Box Non-Fee Amendment
Washington, DC 20231

SIR:

In response to the Office Action dated November 5, 1999 in the above-designated application, please enter the following amendments:

IN THE CLAIMS

Please add the following claims:

31. A casing fill-up and circulating tool operable for filling a casing and for circulating fluid in the casing, said fill-up and circulating tool comprising:

a body having a flow path therein, said body defining at least one first outlet for selective fluid communication between said flow path and the casing and at least one second outlet for selective fluid communication between said flow path and the casing;

a seal for said body for sealing with the casing;

a sliding sleeve mounted to said body, said sliding sleeve being moveable between an open and a closed position for selectively permitting fluid flow from said flow path through said at least one first outlet into the casing; and

a valve for said body in communication with said flow path, said valve being controllable between an open and a closed position for selectively permitting fluid flow from said flow path through said at least one second outlet into the casing.

32. A casing fill-up and circulating tool operable for filling a casing and for circulating fluid in the casing, said fill-up and circulating tool comprising:

a body having a flow path therethrough;

a seal for said body for sealing with the casing;

said body having at least one first outlet for selective communication between said flow path and the inside of the casing, said at least one first outlet being controllable between an open and a closed position for either permitting fluid flow from said flow path into the casing through said at least one first outlet in said open position and for preventing fluid flow through said at least one fluid outlet and into the casing in said closed position; and

said body having at least one second outlet for selective communication between said flow path and the inside of the casing, said at least one second outlet being controllable between an open and a closed position for either permitting fluid flow from said flow path into the casing through said at least one second outlet in said open position and for preventing fluid flow through said at least one fluid outlet and into the casing in said closed position.

33. A casing fill-up and circulating tool operable to fill and to circulate fluid in a casing, said fill-up and circulating tool comprising:

a body defining an axially directed internal flow path, said body having at least one outlet positioned along said body for selective fluid communication between said flow path and the casing;

a seal for said body for sealing with the casing; and

a movable sleeve for selectively blocking and unblocking said at least one outlet, said moveable sleeve being selectively controllable for movement between a first position and a second position to thereby control fluid communication between said internal flow path and said at least one outlet, said moveable sleeve being biased so as to be urged toward at least one of said first position or said second position, whereby said moveable sleeve is operable for selectively preventing or permitting fluid flow from said internal flow path through said at least one outlet and into the casing.

34. A casing fill-up and circulating tool to fill fluid into and to circulate fluid inside a casing, said fill-up and circulating tool comprising:

a body defining an internal flow path, said body having at least one outlet for selective fluid communication between said flow path and the casing;

a seal for said body for sealing with the casing; and

a moveable sleeve mounted to said body, said moveable sleeve being selectively and repeatably controllable for movement between a first position and a second position to thereby control fluid communication between said internal flow path and said at least one outlet, said moveable sleeve being biased towards said first position, said moveable sleeve being operable for movement to said second position independently of a fluid pressure in said internal flow path, whereby said moveable sleeve is operable for selectively preventing or permitting fluid flow from said internal flow path through said at least one outlet and into the casing.

35. An apparatus for filing and circulating casing, comprising:

a body having an axial flow path therethrough, said body being insertable into the casing;
a valve in said body further comprising a valve element engageable with a seat, said body

defining an opening;

said valve element, on application of fluid pressure in said body, is displaced relative to said seat and said body to permit fluid flow through said seat and through said opening in said body and into the casing; and

a shiftable tube extending from said valve element and moving therewith, said shiftable tube having a bore therein to permit fluid flow through said bore and said opening into the casing.

36. An apparatus for filing or circulating casing, comprising:

a body having a flowpath therethrough, said body being insertable into the casing;

a valve in said body further comprising a valve plug and a seat, said body defining an opening;

said valve plug, on application of fluid pressure in said body, is displaced relative to said seat; and

said valve plug further comprises a shiftable tube extending therefrom and moving therewith, having a bore therethrough in fluid communication with said flowpath.

37. A fill-up and circulation tool for inserting into the upper end of a casing string to fill fluid into and to circulate fluid from inside the casing into a wellbore or use on top drive or rotary type drilling rigs, the fill-up and circulation tool comprising:

a mandrel having a central axial bore defining a flowpath therethrough, said mandrel having an inlet, an outlet, an outer surface, and a plurality of apertures near said outlet;

a sliding sleeve in slidable engagement with said mandrel, for opening and closing said plurality of apertures near said outlet;

a top sub assembly connected to the inlet of said mandrel for connecting the mandrel to the rig;

a packer cup mounted with said tool on the mandrel or the sliding sleeve for interference fit with the inside diameter of the casing to seal the casing below the packer cup; and

a stop device for limiting the travel of the sliding sleeve.

Please amend the following claims as indicated:

1. (Amended) A fill-up and circulating tool [for inserting into the upper end of a casing string] to fill fluid into and to circulate fluid from inside [the] a casing [into a wellbore for use on top drive and rotary type drilling rigs], the fill-up and circulating tool comprising:

a [mandrel] body having a central axial bore defining a flow path therethrough, at least one outlet laterally disposed along said [mandrel] body with respect to said central axial bore;

a sleeve [in engagement with] mounted to said [mandrel] body so as to be moveable between a first position and a second position to selectively open and close communication through said at least one outlet from said flow path into the casing [for relieving pressure] to permit fluid flow from said flow path [through said mandrel] through said at least one outlet into the casing, said sleeve being biased so as to be urged toward at least one of said first position or said second position;

[an adjustable top sub assembly connected to said mandrel for variably extending the length thereof]; and

a sealing element disposed about said [mandrel] body for sealing engagement with [the inside diameter of] the casing.

2. (Amended) The fill-up and circulating tool of claim 1, wherein:
engagement of said sealing element with [the] an inside of [said] the casing generally fixes
at least a portion of said [mandrel] body in position with respect to [said] the casing.
3. (Amended) The fill-up and circulating tool of claim [2] 1, further comprising:
a spring mounted to [disposed about the outer surface of] said [mandrel] body [and retained
between said top sub assembly and said sleeve] for biasing said sleeve to cover said
at least one [aperture] outlet [formed through said mandrel body;
a spring stop disposed between said spring and said mandrel to limit the compression of said
spring; and
a lower body connected to said mandrel for limiting the travel of said sleeve].
4. (Amended) The fill-up and circulating tool of claim [3] 1, further comprising:
a cementing head assembly connected atop said fill-up and circulating tool; and
a wiper plug assembly having at least one detachable plug in functional connection with said
fill-up and circulating tool for wiping the inside diameter of [said] the casing.
6. (Amended) The fill-up and circulating tool of claim 5, wherein:
said ball carrier assembly carries one or more [operationally] balls disposed therein.
7. (Amended) The fill-up and circulating tool of claim 4, wherein:
said [mandrel] body includes at least one screw aperture [and] for a set screw disposable
therein[, said set screw for engaging with an upper surface of said spring stop] for
fixing said sleeve in position to cover said at least one said outlet [mandrel aperture].

8. (Amended) The fill-up and circulating tool of claim 5, wherein:

said [mandrel] body includes at least one screw aperture [and] for a set screw disposable therein[, [said set screw for engaging with an upper surface of said spring stop] for fixing said sleeve in position to cover said at least one said outlet [mandrel aperture].

9. (Amended) The fill-up and circulating tool of claim 6, wherein:

said [mandrel] body includes at least one screw aperture [and] for a set screw disposable therein[, said set screw for engaging with an upper surface of said spring stop] for fixing said sleeve in position to cover said at least one said outlet [mandrel aperture].

10. (Amended) A fill-up and circulating tool [for inserting into the upper end of a casing string] to fill fluid into and to circulate fluid from inside [the] a casing [into a wellbore for use on a top drive and rotary type drilling rigs], the tool comprising:

a [mandrel] body having a central axial bore defining a flow path therethrough:

a pressure relief device in fluid communication with said [mandrel] body for relieving pressure [therethrough] from inside the casing to said flow path within said body when a casing pressure is greater than a pressure in said flow path;

a sleeve for said body moveable between an open position and a closed position for providing an outlet laterally disposed with respect to said flow path for fluid flow into the casing from said flow path, when said sleeve is in said closed position fluid flow from said flow path through said outlet is prevented, when said sleeve is in said open position fluid flow from said flow path through said outlet is permitted, said sleeve being biased so as to be urged toward at least one of said open

or closed positions, whereby said sleeve is selectively moveable between said open position and said closed position to control fluid flow between said flow path through said outlet and the casing;

[a top sub assembly connected to the mandrel for variably extending the length thereof;] and
a sealing element for sealing engagement with [the inside diameter of said] the casing.

11. (Amended) The fill-up and circulating tool of Claim 10, wherein:
engagement of said sealing element with [the] an inside diameter of [said] the casing
generally fixes said [mandrel] at least a portion of said body in position with respect
to [said] the casing.

12. (Amended) The fill-up and circulating tool of Claim 10, further comprising:
a valve for controlling the flow of fluid through the [mandrel] body and into the casing.

13. (Amended) The fill-up and circulating tool of claim 11, further comprising:
a cementing head assembly connected atop said fill-up and circulating tool; and
a wiper plug assembly having at least one detachable plug in functional connection with said
fill-up and circulating tool for wiping the inside diameter of [said] the casing.

15. (Amended) The fill-up and circulating tool of claim 14, wherein:
said ball carrier assembly carries one or more [operationally] balls disposed therein.

16. (Amended) A casing fill-up and circulating tool [insertable into the upper end of a
casing string] to fill [the] a casing [string] with fluid and to circulate fluid from inside
the casing [string], the tool comprising:

a [mandrel] body having a top end and a bottom end forming an axial fluid flow pathway therethrough; said top end adapted for connecting to [the] a surface drilling apparatus;

a sleeve moveable with respect to said body, said sleeve being biased so as to be urged toward a first position and operably moveable to a second position for controlling fluid flow from said axial fluid flow pathway into the casing;

a sealing element connected about said [mandrel] body[, said sealing element adapted for engaging the interior of said casing when inserted therein preventing fluid flow between said sealing element and said casing]; and

a pressure relief apparatus in connection with said [mandrel] body, said pressure relief apparatus being operable for providing [a fluid pathway therethrough in] fluid communication [with] between said [mandrel] axial fluid flow pathway and the casing to permit [for] depressuring [said mandrel and said] the casing when a casing pressure inside the casing is greater than a body pressure within said axial fluid flow pathway.

17. (Amended) The fill-up and circulating tool of Claim 16, wherein:

said pressure relief apparatus forms at least one lateral aperture for relieving back pressure from [said] the casing when desired.

18. (Amended) The fill-up and circulating tool of Claim 17, further comprising:

a blocking member preventing fluid flow through said pressure release apparatus when pressure within said [mandrel] body pathway is greater than pressure in [said] the casing string, and allowing backflow when pressure in [said] the casing is greater than in said pathway.

19. (Amended) The fill-up and circulating tool of Claim 18, wherein:
said blocking member includes a ball, said ball being biased and seated from an [the] interior
of said pressure relief apparatus against said lateral passageway.
20. (Amended) The fill-up and circulating tool of Claim 18, wherein:
said blocking member is a deflectable member disposed within said pressure relief apparatus
[housing] adjacent said lateral aperture.
21. (Amended) The fill-up and circulating tool of claim 16, further comprising:
a cementing head assembly connected atop said fill-up and circulating tool; and
a wiper plug assembly having at least one detachable plug in functional connection with said
fill-up and circulating tool for wiping the inside diameter of [said] the casing.
22. (Amended) The fill-up and circulating tool of claim 21, wherein:
said cementing assembly carries one or more [operationally] balls disposed therein.
23. (Amended) The fill-up and circulating tool of claim 18, further comprising:
a cementing head assembly connected atop said fill-up and circulating tool; and
a wiper plug assembly having at least one detachable plug in functional connection with said
fill-up and circulating tool for wiping the inside diameter of [said] the casing.
24. (Amended) The fill-up and circulating tool of claim 18, wherein:
said cementing assembly carries one or more [operationally] balls disposed therein.
25. (Amended) The fill-up and circulating tool of claim 19, further comprising:

a cementing head assembly connected atop said fill-up and circulating tool; and
a wiper plug assembly having at least one detachable plug in functional connection with said
fill-up and circulating tool for wiping the inside diameter of [said] the casing.

26. (Amended) The fill-up and circulating tool of claim 25, wherein:
said cementing assembly carries one or more [operationally] balls disposed therein.

27. (Amended) The fill-up and circulating tool of claim 20, further comprising:
a cementing head assembly connected atop said fill-up and circulating tool; and
a wiper plug assembly having at least one detachable plug in functional connection with said
fill-up and circulating tool for wiping the inside diameter of [said] the casing.

28. (Amended) The fill-up and circulating tool of claim 27, wherein:
said cementing assembly carries one or more [operationally] balls disposed therein.

[30.] 29. (Amended) A fill-up and circulating tool [insertable into the upper end of a
casing string] to fill [the] a casing string with fluid and to circulate fluid from
inside the casing string, the tool comprising:

a [mandrel] body [having a top end and a bottom end] forming an axial fluid flow pathway
[therethrough] therein, said body defining at least one first outlet to the casing and
at least one second outlet to the casing; [said top end adapted for connecting to the
surface drilling apparatus;]

a sealing element connected about said [mandrel] body, said sealing element adapted for
[engaging the interior of said casing when inserted therein] preventing fluid flow
between said [sealing element] body and [said] the casing;

a sleeve moveably mounted to said body for blocking and unblocking said at least one first outlet to the casing from said axial fluid flow pathway for controlling fluid flow from said axial fluid flow pathway into the casing;

a pressure relief apparatus in connection with said [mandrel] body, said pressure relief apparatus providing a pressure relief fluid pathway [therethrough] in fluid communication with said [mandrel] axial fluid flow pathway and said inside of the casing string for depressuring [said mandrel and said] the casing when a casing pressure inside of the casing string is greater than a body pressure within said axial fluid flow pathway; and

a one-way valve member in fluid communication with said [mandrel] axial fluid flow pathway of said body allowing fluid to pass into [said] the casing from said axial fluid flow pathway through said at least one second outlet [and substantially preventing back flow therethrough].

REMARKS

Claims 31 through 37 are closely related to the above claims and have been added. They are discussed below with respect to the cited prior art. These claims begin with number 31 in accord with the Examiner's comments. The appropriate fee for the additional claims is included

The claims have been amended to remove the outstanding rejection under 35 U.S.C. §112 to claims 1-29 and to further increase their clarity.

Claims 1-29 stand rejected based on nonstatutory double patenting over claims 1-43 of U.S. Patent No. 5,735,348. Applicants also submit that added claims 31-37, although not identical to those claims are also supported and could have been made in that application. Therefore, Applicants respectfully submit herewith a terminal disclaimer in accord with the Examiner's statements for claims 1-29 and 31-37.

Claims 1, 2, 10, 11, 16, and 17 stand rejected under 35 U.S.C. 102(e) as being anticipated by Stokely. Applicants have amended the claims to specify that fluid flow controlled by the sleeve goes from the internal flow passageway into the casing. Stokely does not show this. For Stokely, the fluid flow is used to inflate a packer and does not, and should not flow into the casing. In Stokely, if pressure were vented to the inside of the casing through relief device 112, then Stokely would be inoperative. The elastomeric sealing element would not inflate and circulation could not be effected. Stokely's relief device 112, which is activated by movement of upper body 110 is used to permit flow for inflating elastomeric sealing element 56. Therefore, the inflating fluid is necessarily trapped within chamber 60 so as to be prevented from venting into the casing. See Col. 9, lines 40-50. Movement of the extension sleeve in Stokely is controlled by the hydraulic fluid from port 74, not the fluid used for circulation purposes. Thus, hydraulic fluid is used for inflating the sealing element 56, not for fill-up or circulation fluid. The hydraulic fluid is unrelated to the fluid used to fill the casing or to circulate through the casing. Moreover, it would clearly be undesirable for Stokely to vent or leak the hydraulic fluid into the casing as the packer would not inflate or would deflate at an improper time.

More specifically, in Claims 1, 10, 16, and 29, Applicant's have more clearly specified that the sleeve is used to control fluid flow from the fluid flow passageway into the casing, that thereby results in relieving pressure from within the body into the casing. When sleeve 26 is moved to the position shown in Applicants FIG. 4, this permits circulation fluid flow from the rig pumps through laterally positioned ports 19c into the casing. Circulation may involve high flow that can erode metal and seals rather quickly. Applicant's system avoids erosion by using a sliding sleeve that remains outside the flow of fluid through the laterally positioned ports.

Claims 1, 10, and 16 are even further amended to specify that the sliding sleeve is not only used for controlling circulation into the casing but is also biased so as to be urged toward at least one position or the other. Reviewing the cited art from the file it would appear that US 4,997,042 to

Jordan may also reveal a sliding sleeve that is slotted. However, Jordan's sliding sleeve is not biased nor does it operate to control flow. If Jordan were biased there would be no way to open and close the tool. It would simply stay in the biased position, thereby preventing operation. There is no motivation for Jordan to use the sleeve to control fluid flow because Jordan simply turns the rig pumps on and off. The slotted sleeve in Jordan is moved only to inflate or deflate the packer. A later embodiment of essentially the same tool by the cited art to a second Stokely 5,191,939 shows that if the packer is inflated by a remote line (FIG. 7), then the sleeve is fixed in place as there is no point that it be sliding, much less be a biased sliding sleeve. Jordans sleeve permits both fluid fill and circulation flow unlike Applicant's tool that uses the sleeve to handle increased flow of circulation. In other words Jordan's tool does not show a biased sliding sleeve, Jordan's tool has no reason to have a biased sliding sleeve, and would apparently be inoperable if it did have a biased sliding sleeve.

Moreover, Applicant's use of a biased sleeve rather than a biased valve that remains in the flow path as shown in some cited prior art, e.g. Brisco 5,501,280, is unique. The circulation fluid is a high flow stream that can cut metal. Applicant's biased sliding sleeve moves to open holes that permit the high flow. Valve elements that stay in the path of the fluid flow are thereby easily damaged. Therefore, a biased slidable sleeve as taught by Applicant is unique, not contemplated by the cited prior art, and is a significant improvement over the prior art.

Claims 12 and 29 are rejected under 35 USC 103(a) as being unpatentable over Stokely. As explained above, Stokely does not use or have a biased sliding sleeve for controlling fluid into the casing. Moreover, Applicants provide a second one-way valve for selective control of fluid. The feature of having two separately controllable outlets in a circulation/fill-up tool is highly unique and not shown in any prior art. Stokely does not show two separately operable valves that are used to permit fluid flow from the fluid passageway to the casing. Applicant's use the one-way valve for filling, which is a low flow operation, and the sliding sleeve control for circulation which may be

high flow operation. As discussed above, circulation is high flow that may cut into metal and damage seals. Applicant's use a first valve (the mudsaver valve 34 (FIG. 3) for lower flow fill-up procedure but use a second valve controlled by the biased sliding sleeve for high flow circulation.

Thus, claims 12 and 29 discloses a tool with a moveable sleeve (See 26 in FIG. 4) for communication with the casing, a pressure relief apparatus (such as 44 of FIG. 3A although other pressure relief apparatus are disclosed in the specification, e.g., FIG. 8 or 9), and a one-way mud saver valve also for communication with the casing (See 34 in FIG. 3A). The combination of biased moveable sleeve to control a first outlet and a one-way mudsaver valve to control a second outlet are plainly not shown in the cited prior art. Stokely does not show or contemplate these features.

Claim 31 and 32 add to the above limitations to even more particularly specify the use of separately controllable first and second outlets for a circulating/fill-up tool with the sliding sleeve controlling the first outlet and a valve, such as the mudsaver valve, controlling the second outlet. Neither Stokely nor the prior art discloses these features. The prior art does not show separately operable outlets even though there is an advantage of avoiding erosion if a special outlet is provided for circulation which may often be high pressure and/or high volume flow as compared with simply filling the casing.

As well, Claim 33 specifies a biased sleeve for selectively controlling fluid flow into the casing. Neither Stokely nor the prior art discloses this feature as discussed above. As discussed above, the use of a biased sleeve for controlling high flow fluid flow prevents the sleeve being in the flow path when circulation occurs. The biased sleeve permits open and closing of the biased sleeve to control what may be very high circulation flow in a manner that avoids erosion of the valve element (the biased sleeve) which feature is not shown or contemplated in the prior art.

Claim 34 specifies a movable sleeve operable independently of fluid pressure in the internal flow path through the tool and is also biased. This combination of features is also not shown in the prior art of fill-up and circulation tools.

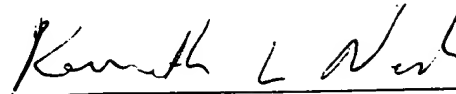
Claims 35 and 36 include additional limitations on the mudsaver valve, described in the previous claims, that has a valve element, such as plug or plunger 40c, that seats against seat 43, the valve element being moveable in response to pressure to open and allow fluid flow through port 19a. A tube extends from the valve element, together comprising element 40, and fluid flows into ports 40b and through the bore of element 40. These features are clearly not shown in Stokely.

Claim 37 is directed to a tool with a sliding sleeve and a cup seal. As discussed above, US 4,997,042 to Jordan may also reveal a sliding sleeve that is slotted. However, if the Jordan tool had a cup seal then the sliding sleeve would be useless because the sliding sleeve is used to fill an inflatable packer in Jordan and has no other purpose. A cup seal must already be extended to engage the casing and is further actuated by the pressure in the casing. The cup seal is used to avoid the need to inflate a seal. As discussed above, a later embodiment of essentially the same tool by the cited art to a second Stokely 5,191,939 shows that if the packer is inflated by a remote line (FIG. 7), then the sleeve is fixed in place as there is no point that it be sliding. The same is true if there is a cup seal. If the tool had a cup seal there would be no need for a hydraulic line or a sliding sleeve as the hydraulic line and sliding sleeve have the same purpose of inflating a packer.

In light of the amendments made to the claims, and the general discussion thereof, Applicant respectfully submits that the application now stands in condition for allowance. If for some reason not contemplated by Applicants, the rejections are not considered traversed by the amendments or if further rejections are applied, Applicants' attorney respectfully requests a telephonic interview so that movement towards allowance can proceed as quickly as possible.

Dated: February 7, 2000.

Respectfully submitted,



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*Improved Method for Multi-Purpose Application for
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